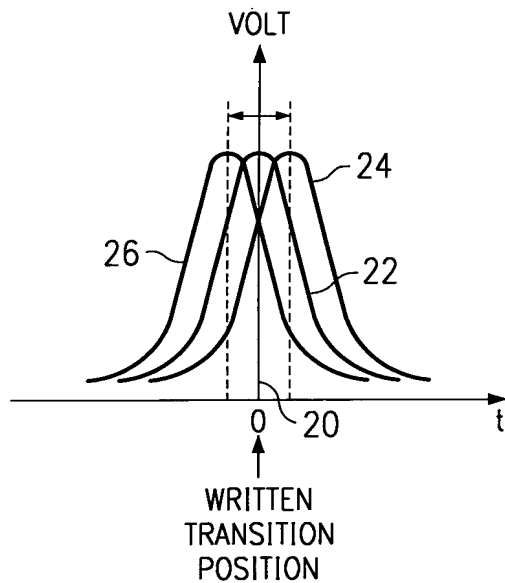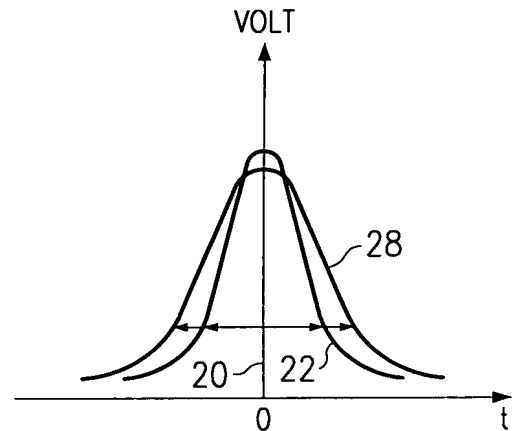TRANSITION GEOMETRY

FIG. 1

POSITION JITTER

FIG. 2

WIDTH VARIATION
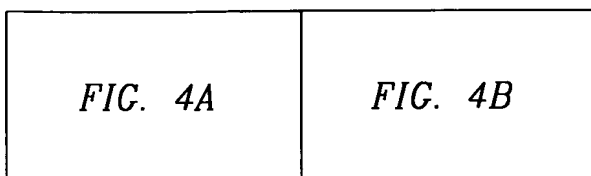
FIG. 3
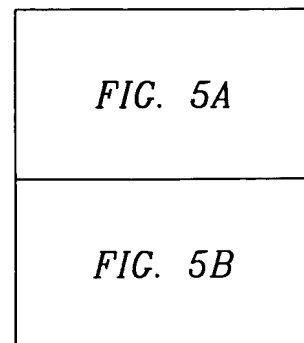
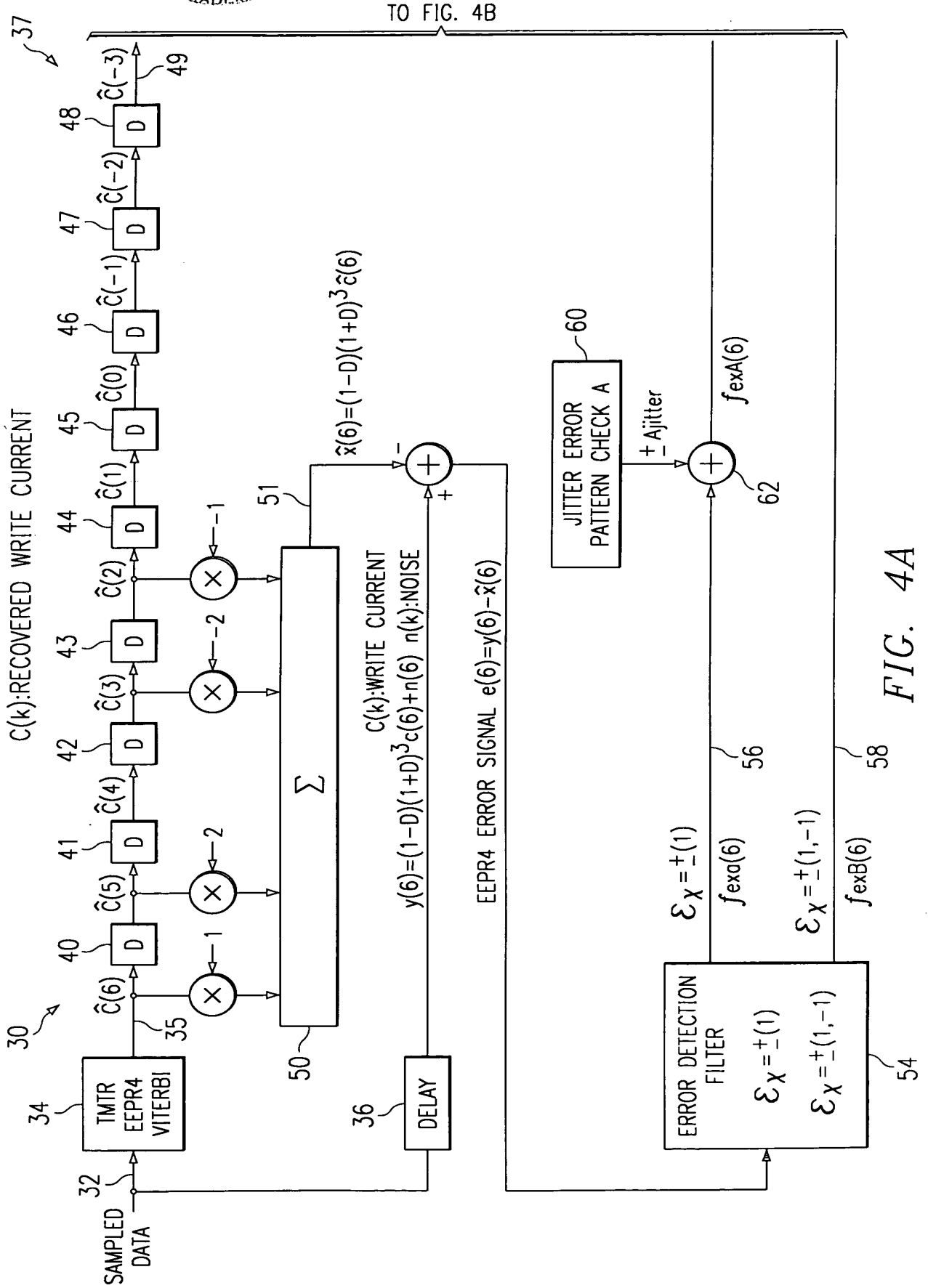*FIG. 4A*   *FIG. 4B*

FIG. 4

FIG. 5A

FIG. 5B

FIG. 5

TO FIG. 4B

C(k):RECOVERED WRITE CURRENT

$\hat{c}(6)$ $\hat{c}(5)$ $\hat{c}(4)$ $\hat{c}(3)$ $\hat{c}(2)$ $\hat{c}(1)$ $\hat{c}(0)$ $\hat{c}(-1)$ $\hat{c}(-2)$ $\hat{c}(-3)$

SAMPLED DATA

32

34 TMTR EEPR4 VITERBI

30

35

40 D 41 D 42 D 43 D 44 D 45 D 46 D 47 D 48 D 49

37

-1 -2 2 -1

$\times$ $\times$ $\times$ $\times$

Σ

50

51

$\hat{x}(6)=(1-D)(1+D)^3\hat{c}(6)$

$-$

$+$

36 DELAY

c(k):WRITE CURRENT

$y(6)=(1-D)(1+D)^3c(6)+n(6)$ n(k):NOISE

EEPR4 ERROR SIGNAL $e(6)=y(6)-\hat{x}(6)$

60 JITTER ERROR PATTERN CHECK A

$+$ Ajitter
$-$

$+$

62

$f_{exA}(6)$

$\mathcal{E}_{\chi=\overset{+}{-}(1)}$

$f_{exa}(6)$

56

$\mathcal{E}_{\chi=\overset{+}{-}(1,-1)}$

$f_{exB}(6)$

58

54 ERROR DETECTION FILTER

$\mathcal{E}_{\chi=\overset{+}{-}(1)}$

$\mathcal{E}_{\chi=\overset{+}{-}(1,-1)}$

FIG. 4A

OUT

73

71 — OUTPUT MODIFICATION

CORRECTION ĉ(0) — 70

CORRECTION ĉ(0) ĉ(1) — 80

49

66 — POLARITY CHECK A

POLARITY CHECK B — 76

64

$f_{exA}(6)$

VthA=2.50

74

$f_{exB}(6)$

VthB=2.25

FROM FIG. 4A

FIG. 4B

TURBO 16/17 EPR4 $\varepsilon_\chi = \pm(1)$ DETECTOR WITH MEDIA NOISE CANCELLATION
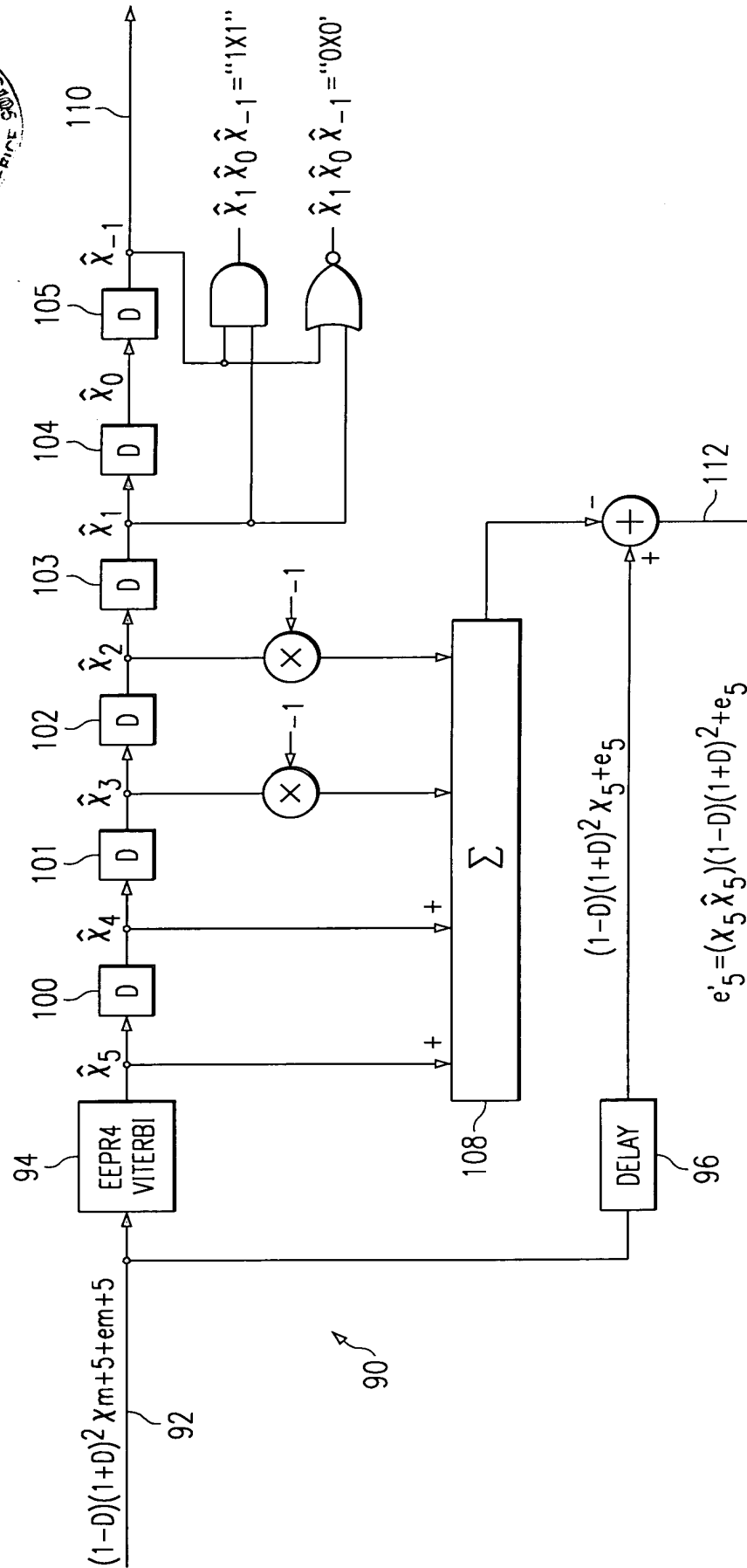
$\hat{\chi}_1 \hat{\chi}_0 \hat{\chi}_{-1} = \text{"1X1"}$

$\hat{\chi}_1 \hat{\chi}_0 \hat{\chi}_{-1} = \text{"0X0"}$

110

105 $\hat{\chi}_{-1}$ D

104 $\hat{\chi}_0$ D

103 $\hat{\chi}_1$ D

102 $\hat{\chi}_2$ D $\times$ -1

101 $\hat{\chi}_3$ D $\times$ -1

100 $\hat{\chi}_4$ D $+$

$\hat{\chi}_5$ $+$

94 EEPR4 VITERBI

Σ

108

$(1-D)(1+D)^2 \chi_5 + e_5$

112

$e'_5 = (\chi_5 \hat{\chi}_5)(1-D)(1+D)^2 + e_5$

DELAY 96

92 $(1-D)(1+D)^2 \chi_{m+5} + e_{m+5}$

90

TO FIG. 5B

FIG. 5A

FROM FIG. 5A

e'_{-2} 120

e'_{-1} 119

e'_0 118

e'_1 117

e'_2 116

e'_3 115

e'_4 114

e'_5

C_7 1

C_6 1

C_5 0.5

C_8 0.25

$\sum$ 125

POLARITY

X_0 ERROR DETECTION

ABS

$+$ $-$ 128

Z

130

$\hat{X}_1 \hat{X}_0 \hat{X}_{-1} = 1X1 \Rightarrow$ $-A$
$\hat{X}_1 \hat{X}_0 \hat{X}_{-1} = 0X0 \Rightarrow$ $+A$
OTHERS $\Rightarrow$ 0

FIG. 5B

BIT ERROR RATE VS SNR

LORENTZIAN
100% MEDIA NOISE
8/9 TMTR EEPR4 (DIGITAL)

BIT ERROR RATE

A JITTER=
6.76 σ JITTER

▲ NO TURBO
● TURBO
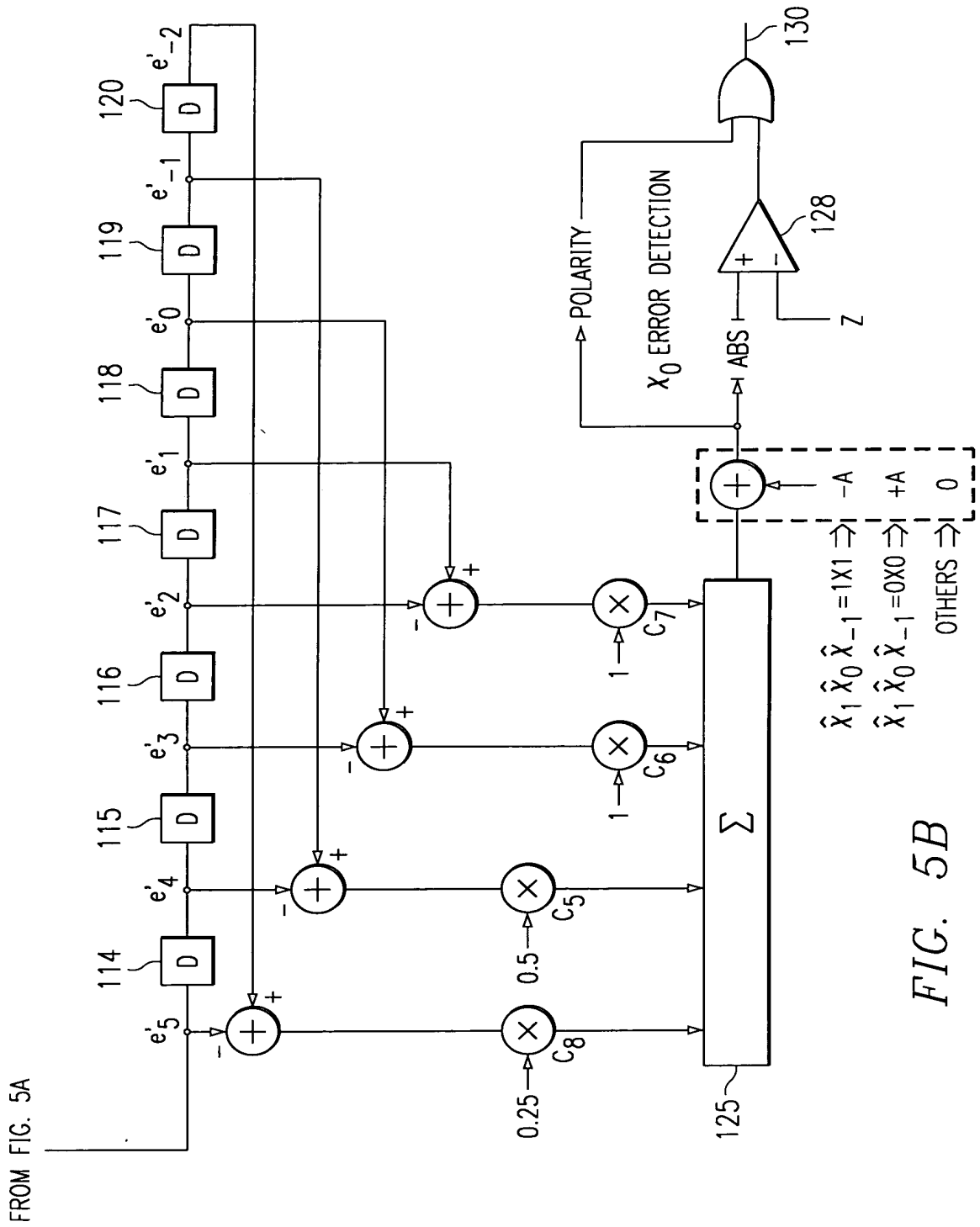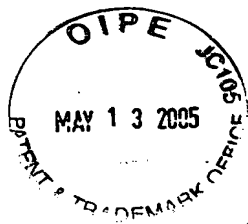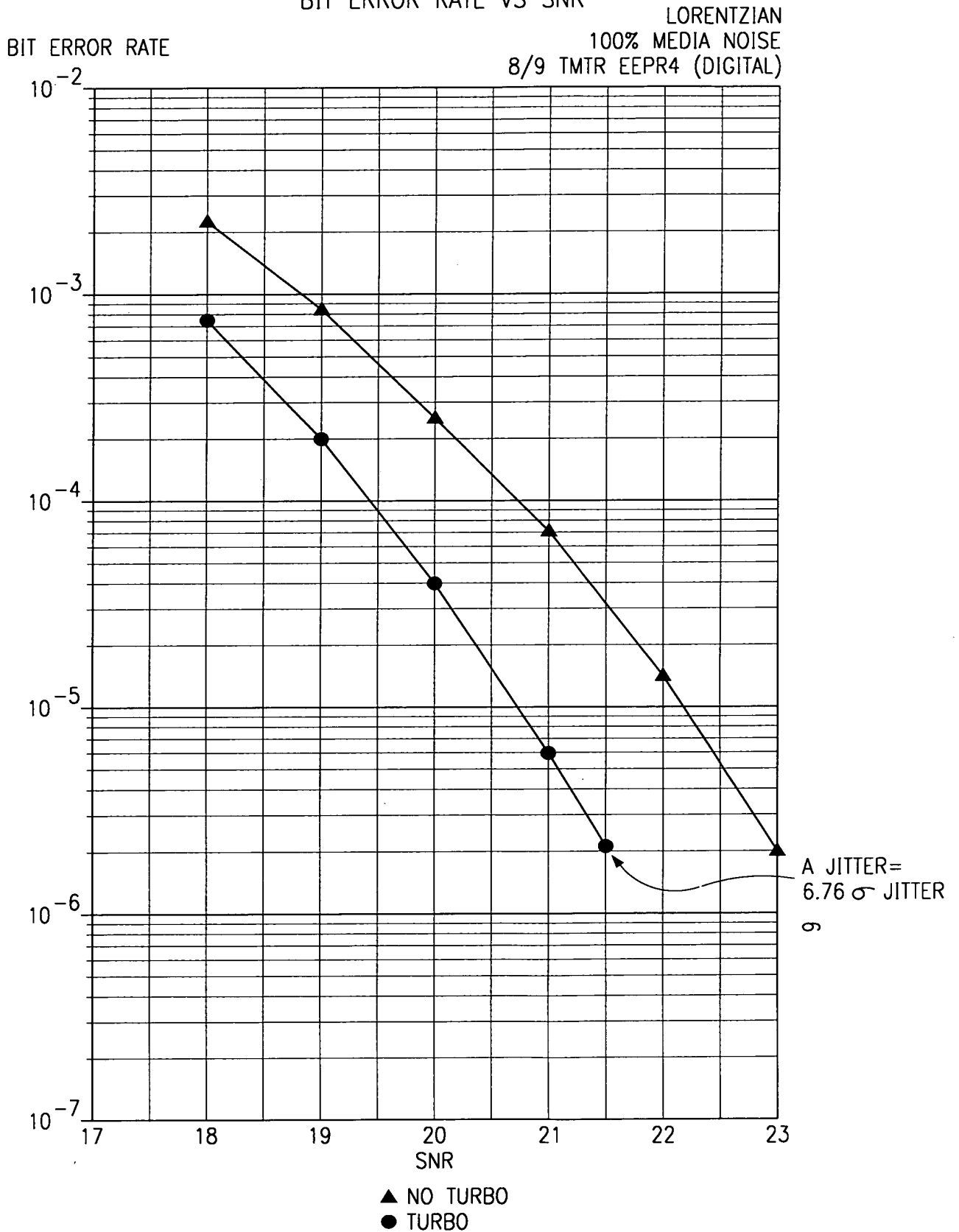
FIG. 6
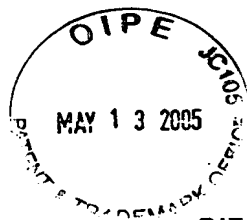
BIT ERROR RATE VS PEAK JITTER
100% MEDIA NOISE EPR4 CHANNEL

LORENTZIAN
100% MEDIA NOISE
16/17 (0,6/8) EEPR4 TURBO FOR MEDIA NOISE

BIT ERROR RATE

-20 LOG(SIGMA_JITTER/Td)

A JITTER=
KX σ JITTER

K=5.26~2.00

K=2.0

K=8.0

IDEAL

K=5.26

FIG. 7